

DRAFT - EPA Comments on SJRWP Remedial Investigation and Feasibility Study Work Plan and Responses

Comment No.	Section	Page	Line	Comment	Response to Comment - Proposed Revision
EPA-1	Whole Document	All	All	Please see the redline/strikeout version of the Draft RI/FS Work Plan and address each edit.	Each of the redline/strikeout edits were discussed at the June 17, 2010, meeting between EPA, TCEQ, and Respondents to discuss EPA comments on the RI/FS Work Plan.
EPA-2	Section 4.2, Section 6.3			Add language ensuring that biological receptors, associated with the current fish consumption advisories identified in Section 2.3.7.5., is included in both the Human Health Site Conceptual Model and the Baseline Human Health Risk Assessment .	Foot notes will be added to the discussions of CSMs in these sections to indicate that exposure pathways to be evaluated may include ingestion of fish that are the subject of advisories.
EPA-3	Section 8. RI/FS Schedule			Add language ensuring that an updated RI/FS schedule is included with every monthly progress report submittal.	The following statement will be added to the end of the last bullet in the text of Section 8: "Each monthly progress report, starting July 15, 2010, will include the most current version of the project schedule."
EPA-4	Figures 2-1, B-2			CSM and data gaps sections refer to an Upland Sand Separation area to be included in soil data collection. This area, south of the bridge, needs to be sampled as there is evidence that the first pits were located there and that those pits drained into the river.	The "Upland Sand Separation Area" is mentioned only in the legends of two maps. This term was originally used to describe the upland properties west of the impoundments, north of Interstate Highway 10 (I-10). This term was changed in response to comments on the Sediment Sampling and Analysis Plan (Sediment SAP) to "Property West of the Impoundments", which is how it appears in the CSM (Figure 4-1). The map legends will be updated with this term. The specifics of the soil sampling design will be provided in the soil SAP, as noted in Section 1.2.
EPA-5	Figure 4-1			Benthic macroinvertebrates – surface water exposure pathway is deemed incomplete. This is incorrect. Benthic macroinvertebrates are certainly exposed to surface water, especially if they build lined tubes (Leptocheirus plumuslosus) of siphon (mussels) water.	The CSM figures will be modified to show that surface water is a complete exposure pathway for benthic macroinvertebrates.
EPA-6	Figures 4-1, 4-4			If the fisher is exposed to sediment, then they are also exposed to porewater by direct contact. The two cannot be separated. This pathway is complete. The same applies for mammals. If they are exposed to sediment then they are also exposed to porewater.	The CSM figures will be modified to show that porewater water is a complete exposure pathway for people that may be exposed to sediments.
EPA-7	Figure 4-3			This figure must be y-axis log-scaled so the figure reflects points near 100.	The scale of Figure 4-3 will be modified as requested.
EPA-8	Figures 4-5, 4-6, B-6			These figures reflect mammals coming into direct contact with sediments. As such they also come into direct contact with porewater and this needs to be reflected in the figures.	The CSM figures will be modified to show that porewater water is a complete exposure pathway for wild mammals that may be exposed to sediments.
EPA-9	Figures 4-5, 4-6, B-6		Foot- note "b"	Footnote "b" states the assumption that birds and mammals do not ingest surface water because it is estuarine; however, the diagram shows complete pathway for birds. Complete pathway for wading birds is the correct assumption (diagram) regardless of salinity.	Agree.
EPA-10	Figures 4-5, 4-6, B-6			Benthic macroinvertebrates and fish do ingest surface water, therefore, these should be shown as complete pathways. It's not just respiration. When fish eat, they ingest water. This is why freshwater and salt water fish have opposite mechanisms for ridding or conserving body salt concentrations.	The CSM figures will be modified to show that fish and invertebrates ingest surface water.
EPA-11	Whole Document			<p>The following issues needs to be resolved within the RI/FS Work Plan or in the upcoming technical memorandums:</p> <ul style="list-style-type: none">No models are specified for evaluating particle transport and settling, including resuspension.No test methods are proposed for any clean sediment that may result from the hydrocyclone (can this sediment serve as beneficial use?).The air pathway seems to be absent during the FS alternatives evaluation. For example: no volatilization evaluation is proposed for the CDF alternative; yet if a CDF is constructed, in-situ or	<p>Our responses include the following, in the order presented by the comment:</p> <ul style="list-style-type: none">Particle transport is addressed by the <i>Draft Sampling and Analysis Plan Addendum: Chemical Fate and Transport Modeling Study, San Jacinto River Waste Pits Superfund Site</i> (Anchor QEA 2010) submitted on May 11, 2010.As discussed in the June 17, 2010, meeting with EPA and TCEQ, it is premature to discuss the use of a hydrocyclone in detail, but text will be modified to indicate that this technology will be considered.

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				<p>mechanical dewatering methods will release volatile compounds.</p> <ul style="list-style-type: none">The disposal option may want to consider geosorbents as possible components.	<ul style="list-style-type: none">Volatile organic compounds have not been found in recent sediment sampling of both surface and subsurface sediments within the waste impoundments. The air pathway is therefore not considered by the RI.Geosorbents will be considered in the FS; text will be added to Section 7.6 of the document to indicate this.
EPA-12	Section 2.2.5, Geology	Pages 15-17	Second paragraph:	Reference to Figure 2-6 is not correct. The cross-section is shown on Figure 2-7. Additionally, this cross-section is not accurate based on the Table 2, Sediment Characteristics Data, from the TXDOT (Weston) Sediment Sampling Report, San Jacinto River Bridge Dolphin Project, dated 2006. For example, according to Table 2, for deep boring D1 there is a sand layer in the 18-20 foot depth interval. There are other inconsistencies between the Table 2 data and the cross-section interpretation as presented in Figure 2-7. The cross-section needs to be corrected to reflect laboratory sediment characteristic data from Table 2, which is more reliable than a subjective visual field observation. As corrected, the cross-section will show a typical sequence of interbedded and interfingered fluvio-deltaic sands, silty sands, silts, clayey silts, silty clays, and clay layers. As corrected, a cross-section such as this will also illustrate a strong possibility for vertical and horizontal movement of contaminants from the Site into the upper portion of the Chicot aquifer.	A more detailed representation of the groundwater conceptual site model was presented by Respondents at the June 17, 2010, meeting with EPA and TCEQ. The text and figures of sections 2.2.5 and 2.2.6 will be revised to more fully describe the groundwater system at the Site and its geological context, including the geological strata underlying the Site as informed by the TxDOT sediment sampling report (Weston 2006), and new figures and reference materials will be added to better explain the likely groundwater system and potential fate and transport of dioxin in groundwater at the Site.
EPA-13	Section 2.2.5, Geology	Pages 15-17	Second paragraph:	The text and Table 2-2 described three groundwater wells which are within 3,000 feet east and southeast of impoundments. These wells are used for public water supply and are completed in a relatively shallow Upper and Lower Chicot formation. The wells are downgradient from the Site according to the general groundwater flow direction. The investigation should incorporate water quality data for these wells, including the data related to the site contaminants.	<p>The available general water quality data from these wells was evaluated and presented in our meeting with EPA and TCEQ on June 17, 2010. The data showed that the water in these wells was much less saline than surface water from the San Jacinto River, and indicate the Beaumont Clay formation likely acts as an aquitard to prevent downward near surface groundwater and surface water from penetrating into the upper Chicot.</p> <p>It was recognized in the meeting that more recent well water data and measurements of potential contaminant concentrations in groundwater would address data gaps associated with potential fate and transport issues of contaminants in the shallow groundwater, and deeper groundwater in the Chicot Aquifer. The text of Sections 5 and 6 will be revised to reflect these data gaps and recommendations for additional sampling.</p>
EPA-14	Section 3, Assessment of Data Quality and Usability	Page 48:		Regarding historical data relevant to the Remedial Investigation (RI) process, data quality reviews were performed to ensure such data are used appropriately during the RI process. The vast majority of such data was classified as Category 2, generally viewed as of unknown or of suspect quality. It is unclear from the text if the needed QA/QC data is not available, is suspect, or was not contained in the documentation available to the Respondents. Considering the potential value of the historical sediment, surface water, and tissue data to RI modeling efforts on both fate and transport and bioaccumulation, additional effort is warranted to conclusively classify existing data by obtaining the relevant QA/QC information, particularly that generated by the TCEQ TMDL program. This will likely entail independently obtaining the needed information directly from the contractor files.	Detailed data quality analyses will be conducted for those data sets considered relevant to the issues addressed by the RI/FS. Text will be added to the introductory paragraphs of Section 3 to clarify.
EPA-15	Section 4, Conceptual Site Model (CSM)	Page 52:		The text (Section 4.1.1) notes the work of Louchouart and Brinkmeyer, 2009, regarding locations with very high dioxin levels, such as at the impoundment. Such conditions exceed the sorption capacity of sediments potentially resulting in high levels of dissolved dioxins partitioning to the water column. Future work on fate and transport issues must consider the extended time period that surface waters have been in contact with pulp mill waste, including within the impoundments. This is in addition to evaluation of the partition dynamics between affected sediments and the water column.	Anchor QEA (2010) describes the approach to chemical fate and transport modeling for the Site in greater detail.
EPA-16	Section 4, Conceptual Site Model (CSM)			Based on aerial photographs, TCEQ notes that the impoundments have been at least partially submerged in the San Jacinto River for approximately 37 years and remain so. Given that the San Jacinto River provides about 28% of the freshwater inflow to the Galveston Bay system, it is apparent that such partitioning from pulp mill waste to the water column has the potential to represent significant loading to the system and result in a spatial distribution within both water and tissue that is significantly different than the sediment fingerprinting results of Louchouart and Brinkmeyer, 2009. The Respondents should provide text indicating that the RI process will evaluate this transport scenario. Furthermore, Figure 4-2 (Physical/ Chemical Fate and Transport Processes) should be revised to show pulp mill waste in direct contact with surface waters.	Anchor QEA (2010) describes the approach to chemical fate and transport modeling for the Site in greater detail, and addresses transport by water. Direct contact of surface waters with the waste in the impoundments is addressed.
EPA-17	Section 4.1.2, Dioxin and Furan	Page 56 and Table 4-1:		Toxicity equivalency factors (TEFs) for dioxins and furans are presented. However, only the 17 dioxin and furan congeners with dioxin-like toxicity are listed. The Texas Risk Reduction Rule TAC§350.76(d)(2)(B)	Details of Site investigations are provided by SAPs, as noted at the end of Section 1.2. The two SAPs submitted so far, the Sediment SAP and the Tissue SAP include the so-

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	Toxicity			states "Further, when congener concentrations are available, the contribution of dioxin-like polychlorinated biphenyls to total dioxin equivalents shall be considered." Please clarify whether new data will be analyzed for congeners since congener data are available for sites outside of the impoundment.	called "dioxin-like" PCB congeners among the chemical analytes, but their analysis in tissue is dependent on results of analysis of sediment chemistry results, as described in Section 1.5 of the Draft Tissue SAP. Section 1.5 of the Tissue SAP also indicates that COPCs may be selected for analysis in tissue if other information is available to suggest that tissue concentrations may be elevated as a result of exposure to contaminants in the waste impoundments. Text will be added to the discussion on page 57 of the Work Plan to clarify under what circumstances dioxin-like PCB congeners will be considered in toxicity assessment, and that TEFs provided by van den Berg (2006, 1998) will be used to evaluate the potential toxicity of PCB congeners, as appropriate. Table 4-1 will not be modified because its purpose is to show the TEFs for dioxins and furans.
EPA-18	Table 4-1, Toxicity Equivalency Factors for Dioxins and Furans			Mammalian TEFs, Avian TEFs, and Fish TEFs all have a reference letter, either a or b. However, there are no footnotes for these references in the Notes section for this figure. Also, it is unclear if "mammalian" includes humans.	The typographical errors will be corrected. Mammalian TEFs are used to address toxicity to humans; this will be noted in the table.
EPA-19	Section 4.2, Human Health Site Conceptual Model	Page 60:		Figures 4-4 and 4-5 are referred to in this section. It is stated that Figure 4-4 is a simple CSM of the release and exposure pathways and that Figure 4-5 presents a CSM exposure diagram for human receptors. However, it appears that Figure 4-4 is the human receptor CSM, Figure 4-5 is the ecological receptor CSM, and Figure 4-1 is the overall CSM.	The typographical errors will be corrected.
EPA-20	Section 4.2.1, Human Health Receptors	Page 60:		It is stated that three potential receptors have been identified for evaluation in the BHHRA: a fisher, a recreational visitor, and a trespasser. As noted in the comments on the Draft Sediment SAP (comment on Figure 6), a distinction needs to be made between the recreational and subsistence fisher pathways. Fish ingestion rates differ between these two pathways and both pathways should be considered.	Both the recreational and subsistence fishers will be included in a revised CSM figure, and text will be edited. Specific rates of ingestion will be discussed in the Exposure Assessment Memorandum, to be submitted on or before December, 2011, as indicated in Section 8 of the Work Plan. This will be noted in the revised discussion of this CSM.
EPA-21	Figure 4-4, Conceptual Site Model for Human Health			The fisher exposure to pore water with dermal contact is considered an incomplete pathway. It is unclear why this would be considered an incomplete pathway while the recreational visitor and trespassers are considered complete.	The CSM figures will be modified to show that porewater water is a complete exposure pathway for people that may be exposed to sediments.
EPA-22	Section 4.2.2, Human Health Exposure Pathways	Page 61:		Due to the lack of information on the Site's groundwater chemistry, an additional potential exposure route should be included for off-site groundwater ingestion. Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (PCDD/Fs) are hydrophobic organic substances which strongly adsorb to soil particles. Once adsorbed, they are believed to be virtually immobile. However, research in the last decades has confirmed that strong sorbing contaminants may reach the groundwater via colloid-facilitated transport.	A more detailed representation of the groundwater conceptual site model was presented by Respondents at the June 17, 2010, meeting with EPA and TCEQ. The text and figures of sections 2.2.5 and 2.2.6 will be revised to more fully describe the groundwater system at the Site and its geological context. On July 17, 2010, TCEQ provided Respondents with a research citation to support statements in the comment about colloidal transport of dioxins and furans. This and related research, if found, will be included in the revised discussion.
EPA-23	Section 4.2.2, Human Health Exposure Pathways	Page 61:		Figure 4-5 indicates that consumption of fish by recreational visitors is the only incomplete exposure pathway identified. The figure being referred to appears to be Figure 4-4 rather than Figure 4-5. Also, in Figure 4-1 and 4-4 the fisher dermal exposure to pore water is considered incomplete, and in Figure 4-1, only the recreational visitor exposure to surface water is considered incomplete.	The typographical errors will be corrected.
EPA-24	Section 4.3 Ecological Site Conceptual Model	Page 61:		TCEQ recommends an additional mammalian measurement receptor is necessary to adequately characterize risk in the BERA; specifically, the marsh rice rat should be included due to its likely presence, moderate body weight, and partially carnivorous diet. We note that their diet includes fiddler crabs, fish, and clams.	Agree, the marsh rice rat will be added to the list of ecological receptors.
EPA-25	Section 5, Study Elements and Data Needs	Page 64:		Study Elements 1 through 3 need to include groundwater for consideration.	A more detailed representation of the groundwater conceptual site model was presented by Respondents at the June 17, 2010, meeting with EPA and TCEQ. The text and figures of sections 2.2.5 and 2.2.6 will be revised to more fully describe the groundwater CSM for the Site.

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					<p>As agreed at the meeting on June 17, 2010, with EPA and TCEQ, the approach outlined in the response to Comments 13 and 22 will address the most immediate uncertainties associated with groundwater at the Site, i.e., whether there is contamination of off-site wells that access the Chicot or Evangeline aquifers with dioxins and furans from the Site, resulting in a complete exposure pathway via deep groundwater. Chemical concentrations in shallow groundwater at the Site are not considered a data gap in Section 5 for Study Elements 1 and 2.</p> <p>Groundwater will not be evaluated for Study Element 2, Exposure Assessment because shallow groundwater is non potable and does not represent a complete exposure pathway to human receptors.</p> <p>Generally speaking, exposure of ecological receptors to shallow groundwater in an estuarine environment would occur as the groundwater moves through surface sediment, i.e., as sediment porewater. As described in the response to comment 31, it is not necessary to directly measure porewater chemistry to address exposures of ecological receptors to dioxins and furans in porewater.</p>
EPA-26	Figures 4-1 and 4-2			Groundwater needs to be included in the exposure media and the physical/chemical fate and transport processes.	Please see the response to Comments 13, 22, and 25.
EPA-27	Figures 4-4, 4-5, and 4-6			Groundwater needs to be included as a separate exposure media.	Please see the response to Comments 13, 22, and 25.
EPA-28	Section 5.2.2, Sediment Data Gaps	Page 68:		PCBs are not mentioned in this section as being part of the primary COPCs, even though they are clearly identified as a primary COPC elsewhere. It is also stated that sediment data within the impoundments are extensive; however, as stated in the Sediment SAP and in Appendix C, PCB congener data are not available for sediment data within the impoundments, which is why they are being collected and analyzed. Therefore, it is unclear if this is viewed as a data gap. Also, please clarify whether future samples will be analyzed for PCB congeners.	<p>Text in Section 5.2.2 will be clarified to indicate that concentrations of PCBs in sediments at the Site are considered a data gap.</p> <p>Please also see the response to Comment 17.</p>
EPA-29	Section 5.2.3, Water Data Gaps	Page 69:		It is stated that human exposures via water are considered negligible because people are not expected to ingest substantial quantities of water from the Site. This is a known swimming and recreational area. In the Texas Risk Reduction Rule TAC§350.71(c) it states “The person shall develop PCLs for each of the following human health exposure pathways which are complete or reasonably anticipated to be complete.”	<p>The first paragraph of Section 5.2.3 will be modified to remove language suggesting a premature conclusion of the risk analysis, i.e., that human exposures via surface water are negligible. The sentence will be revised to the following:</p> <p>“Human exposures via ingestion of water may be low relative to exposures resulting from ingestion of contaminated sediment and tissue from the Site because people are not expected to ingest...”</p>
EPA-30	Section 5.2.4, Tissue Data Gaps	Page 69:		While it is realized that more details will be provided in the Tissue SAP, please be aware that one main objective of cleanup of the Site is to remove the fishing advisories that provide protection of the consumption of edible fish and shellfish by humans. Therefore, tissue samples should include the species representative of those advisories for this area: catfish and blue crab.	Catfish and blue crab are included among the tissues to be sampled at the Site, as described in the Tissue SAP.
EPA-31	Section 6.1.2 Surface Water Investigation	Page 79:		The discussion indicates that if the analysis of sediment and tissue data from the Site indicates that potential risks are not adequately explained by sediment exposures, then the chemical fate and transport model will be used with partitioning parameters to predict dissolved concentrations of COPCs. The text goes on to state that if large uncertainties in risk assessment results are due to the use of these estimates, then confirmatory sampling of water quality conditions may be considered in a future phase of site investigation. The Respondents may also want to consider collection of sediment pore water samples in and adjacent to the pits to evaluate dissolved dioxin/furans in the pore water as an exposure medium and source medium (for releases to the water column).	<p>As discussed and agreed at the June 17, 2010, meeting with EPA and TCEQ, it is not necessary to measure dioxin and furan concentrations of dioxins and furans in porewater to evaluate exposure to human or ecological receptors because:</p> <ul style="list-style-type: none">Exposure of ecological receptors will be evaluated by measuring tissue concentrations in surrogates for those ecological receptors that could be directly exposed to sediment porewater.The literature reviewed in Attachment 2 to Appendix B of the RI/FS Work Plan shows that 2,3,7,8-TCDD is not toxic to benthic invertebrates at or below the solubility level. Any measured concentration would below both solubility and toxicity thresholds for benthic invertebrates.

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					<ul style="list-style-type: none">Evaluation of human exposures to porewater is inherent in the method that will be used to evaluate dermal contact exposures in sediment because the sediment in contact with the dermis is assumed to be wet. <p>Whether measured concentrations of dioxins and furans in porewater is a data gap, will depend on results of the first two steps of the chemical fate and transport analysis.</p> <p>This series of decisions will be clarified in the text of the Work Plan.</p>
EPA-32	Section 6.1.3.1 Tissue Sampling and Analysis	Page 80:		Sediment ingestion is indicated as a minor pathway for omnivorous fish (Fig 4-6). The Respondents may want to consider collection of striped mullet (Mugil cephalus). Although these fish do migrate, they are important forage fish along the Gulf Coast and sediment exposure is maximized since adults commonly feed by sucking up the top layer of sediment.	Respondents agree that mullet is a good (if conservative) indicator of fish exposures due to sediment ingestion. The Tissue SAP targets catfish, and includes the mullet as a surrogate if catfish cannot be found or captured for the study.
EPA-33	Section 6.1.3.1 Tissue Sampling and Analysis	Page 80:		Text should state the intent to analyze tissue samples for PCB congeners, in order to determine total dose to compounds with dioxin-like toxicity in the BERA (EPA, 2008).	<p>Please see the response to Comment 17. PCBs are secondary COPCs because they were never detected in sediments from within the impoundments, but they are potentially bioaccumulative. However, there are no data for PCB congeners in sediments from within the impoundments; existing data report concentration of Aroclors. PCB congeners are included among the analytes for sediments as described in the Sediment SAP. Results of the sediment sampling will provide additional information on PCB congeners, and the potential for exposure to PCB congeners due to contact with sediments from the impoundments can be evaluated.</p> <p>The text of Section 6.1.3.1 will be edited to clarify the process for selection of chemical analytes in tissue, and will be consistent with the text of Section 1.5 of the draft Tissue SAP.</p>
EPA-34	Section 6.4 Baseline Ecological Risk Assessment	Page 102:		Please clarify if a BERA Workplan will be part of the RI process.	A BERA Work Plan is not required by the UAO, and is therefore not planned for this project. Details of the study designs are presented in SAPs, and the data quality objectives in each SAP explain the relationship of the targeted data to the risk assessments. Text will be added to the end of Section 1.2 to clarify this.
EPA-35	Section 6.4.3.1 Aquatic Life	Page 106:		The discussion indicates that to evaluate exposure of fish through ingestion, concentrations of COPCs in each ingested medium (food and sediment) will be compared to the toxicity reference value (TRVs) expressed as dietary concentrations (mg/kg diet). The TCEQ is primarily aware of effect levels for fish in terms of residue levels. How will TRVs (as dietary concentrations) be derived for fish?	<p>Recently, a Pellston Workshop was convened by the Society of Environmental Toxicology and Chemistry (SETAC) to discuss the use of critical tissue residues as a means to assess toxicity to aquatic organisms. The workshop concluded that, with few exceptions, critical tissue residues are not an appropriate means to evaluate toxicity to aquatic organisms for metals. Therefore, metals TRVs for fish will be expressed as a concentration in the food of fish. In addition, several polycyclic aromatic hydrocarbons (PAH) compounds are secondary COPCs, and may require evaluation in the risk assessment. Use of critical tissue residues for PAHs can also be problematic, since fish can metabolize and excrete many of these compounds, while ingestion exposures may be associated with effects.</p> <p>The method described in Section 6.4.3.1 will be used primarily for metals and PAHs, if necessary, as a result of analysis of sediment chemistry, will be clarified in the text of this section. The method may be used for other organic compounds if a reasonable ingestion exposure-response relationship is available for an organic chemical in the literature. TRVs will be derived on the basis of feeding studies in which the subject toxicant is administered to test subjects in their food.</p>
EPA-36	Section 6.4.3.2 Aquatic-dependent Wildlife	Page 106:		Please define, “UCR” as depicted on page 107.	This is a typographical error and will be corrected.
EPA-37	Section 6.4.4 Measures of Effects	Page 108:		The TCEQ recommends avian receptors be evaluated using both a total dose Hazard Quotient approach and the proposed egg critical tissue residue approach.	Agree. Text throughout Section 6.4 will be checked and edited to include this measure of exposure for birds.

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EPA-38	Section 6.4.4 Measures of Effects	Page 108:		Text recommends sole reliance on the critical tissue residue approach to evaluate effects on fish from dioxin exposure. The TCEQ recommends an additional line of evidence be included in the form of toxicity tests that evaluate early life stage effects on fish from dioxin exposure. For example, the EPA Region 6 Calcasieu Estuary BERA performed 48-hour sediment pore water toxicity tests with redbird (Sciaenops ocellatus) embryos based on an endpoint of hatching success and survival.	The toxicity of dioxins and furans to fish, including early life stages is well described in the literature. A site-specific toxicity test for fish was required at the Calcasieu Estuary because of the mixture of numerous contaminants in sediments at the Site, and resultant uncertainty as to the degree of toxicity, due to exposure to multiple contaminants. For this Site, unless sediment chemistry indicates otherwise, dioxins and furans are considered a reliable indicator chemical group for the RI/FS. In light of the extensive literature available, and the difference in COPCs between the Calcasieu and San Jacinto sites, literature-derived TRVs compared to measured concentrations in fish tissue will be used to assess dioxin and furan risks to fish.
EPA-39	Section 6.4.5.4 Characterization of Background Risks	Page 113:		Text states background ecological risks will be characterized based on both upstream and regional conditions, as determined to be necessary based on risk characterization results. Previous comments have provided TCEQ concerns regarding the potential for upstream sediment and tissue to have been affected by the Site. Regarding the use of regional background, the area fishery is currently subject to a fish consumption advisory and multiple regulatory programs are attempting to lower tissue concentrations. These factors indicate development of a regional background concept within the affected area will be of limited value in determining the need for remedial action or protectiveness of current conditions. Also, the full extent of the area impacted by the Site is undetermined; the spatial effects of site contaminants to the water column and tissue are expected to be distinctly different than that of sediment, and will need to be considered in determining appropriate use of background. Text should be revised to reflect these realities.	A detailed discussion of the uncertainties and data gaps about the quality of sediments and tissue upstream of the Site was presented at the June 17, 2010, meeting with EPA and TCEQ. It was agreed that, due to existing data gaps, conclusions about the appropriateness of the upstream area as a background location for use in the RI/FS are premature. Therefore, no changes to the text are required.
EPA-40	SLERA Section 3.2.1 Benthic Macroinvertebrates	Page B-25:		The discussion on page B-25 states that dioxins and furans will be considered in the evaluation of risks to benthic macroinvertebrates in the BERA based on the information provided in Attachment B2 to this SLERA. Table B-4 should be revised to indicate that dioxins and furans will be retained as a COPC for benthic invertebrate community.	This table (and related tables) will be revised to show that exposure of benthic macroinvertebrates dioxins and furans will be evaluated using tissue concentrations and that risks to benthic macroinvertebrates will be assessed on the basis of tissue measurements.
EPA-41	SLERA Attachment B1			Species That May Be Expected in the Vicinity of the San Jacinto River Waste Pits Site: Looking at the attached tables, a number of state or federally listed threatened or endangered wildlife species could occur in the vicinity of the Site. The Respondents will need to determine if these species could occur at the Site, based on the habitat needs of the receptor. If the receptor cannot be ruled out, the BERA should designate a surrogate species for the protected species and base any hazard quotient calculations or risk characterization on the NOAEL TRV or equivalent.	Agree. Text of Appendix B and Attachment B1 will be modified to address the appropriate surrogate species for any listed species that may occur at the Site.
EPA-42	Whole Document - Est.			The RI/FS Work Plan should consider all appropriate removal actions and remediation solutions with equal weight and not be slanted toward use of a Confined Disposal Facility (CDF). Alternatives such as excavation and off-site disposal of the source waste fill need to be addressed more fully. This comment relates to Section 1.2.1 - Site Management, Section 5.4 - Study Element 4: Engineering Design Evaluation, Section 6.1.1 – Sediment, and Section 7.6.4 -Disposal Technologies.	Agree. Text will be modified as indicated for this subject in EPA's redline edits to the word file.
EPA-43	Whole Document - Est.			The evaluation of remedies should consider applicable federal requirements such as flood impacts of any proposed structure (if a structure that blocks additional flow area of the river is selected) as well as the stability of the I-10 bridge (if additional scour is introduced by a restriction of the upstream flow area caused by a remedy).	Agree. The text in Section 7.3 will be modified to reflect this requirement.
EPA-44	Section 2.1 - Est.			The RI/FS Work Plan does not address the following two sites that should be incorporated into this plan: <ul style="list-style-type: none">As per an interoffice memo of the State Health Department concerning an investigation conducted on April 22, 1966, the same waste as contained in the SJRWPSS was also deposited in a pit located south of the Superfund Site. As this waste fill may represent a similar threat to the human health and the environment and was the waste generated by Champion Paper Company, this location should also be investigated for inclusion in the scope of this RI/FS Work Plan. This location is currently described as Tract 4J of Abstract 330 of the J.T. Harrell Survey.As indicated by review of aerial photos, some type of pit excavation and filling occurred on what is now described as Tracts 4F and 4F-1 of Abstract 330 of the J.T. Harrell Survey. A pit appears to be under excavation as indicated in a 1964 aerial photo, and from additional aerial photos, was filled between 1966 and 1969, with possible additional filling between 1969 and 1973.	To be determined.

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EPA-45	Whole Document - Est.			<p>The report cited as Louchouart and Brinkmeyer (2009), is a study on Phase I of a multi-year study designed to examine the sequestrations and microbial degradation of dioxins in the Houston Ship Channel/Galveston Bay (HSC/GB) system. The conclusions of this report on page 13 ends with the following statement:</p> <p><i>‘Although this work is based on empirical sorption coefficients that are relevant to the environment of study, accurate porewater concentrations (and thus bioaccumulation potential) need to be measured directly before any meaningful risk assessment and remediation strategy are to be devised.’</i></p> <p>Thus, reliance on this source should be tempered with this limitation and cited only when appropriate. In particular, the statements attributed to this cited report in Section 4.1.1 Page 54, Section 4.1.3, Page 58, and Section 6.1.2, Page 79 should be revised recognizing this limitation.</p>	<p>Citation of Louchouart and Brinkmeyer (2009) in Section 4.1.1 discusses only modeling results, comparing outcomes with different assumptions, and not addressing risk. The discussion on page 58 describes fingerprinting results. The discussion in Section 6.1.2 in which this report was cited was deleted by EPA. For the topics discussed in Section 4.1.1 and 4.1.3, the quote provided in the comment is not relevant. It will be added to the text of Section 2.3.7.1, where the content of the quote is relevant to the overall discussion.</p>
EPA-46	Section 2.1	Page 10, Site History.		<p>This section omits a critical fact regarding discharges of waste from the Site. A sentence should be added to this paragraph to the effect that some waste was pumped from the Site into the San Jacinto River as noted in a letter to MIMC from the Harris County Health Unit dated December 28, 1965.</p>	<p>The requested edit will be made.</p>
EPA-47	Section 2.1	Page 10, Site History.		<p>This section describes the Site as having “late successional stage estuarine riparian vegetation.” During a Site visit, the Site seemed dominated by hackberry trees which are often considered pioneer or early successional stage trees in this portion of the State of Texas. The basis for the characterization of the Site as having vegetation characteristic of a late successional stage should be validated to verify this description. This description is also used in Section 2.2.2.</p>	<p>The subject text will be edited to delete the words “late successional stage.”</p>
EPA-48	Section 2.2.3	Page 13, Land Use.		<p>This section states: “There are three registered point sources of dioxins and furans upstream of the Site on the San Jacinto River and one immediately downstream (Figure 2-4: Table 2-1).” It is not clear what references are used for these registrations. Defining other sources of dioxins and furans is an important part of this study and the other sources need to be carefully defined with supporting documentation.</p>	<p>Revisions to this section were discussed with EPA and TCEQ on June 17, 2010, at a meeting to discuss these comments. This section will be substantially revised to describe the following:</p> <ul style="list-style-type: none">• Locations of facilities upstream of the Site with discharge permits• Locations of sludge and effluent samples that were collected by the TMDL program upstream of the Site.• The text and table will be clarified as to whether the presence of dioxins and furans or their permitted release has been verified in permit records of by the sludge/effluent sample. Appropriate documentation, requested by the comment, will be provided.
EPA-49	Section 2.2.7	Page 18, Surface Water Use.		<p>This section states in the first paragraph, “Fish consumption in the San Jacinto River, both up and downstream of the Site is restricted” The language in the RI/FS Work Plan suggests that there is some governmental agency which is patrolling the area to dissuade fish consumption. Harris County requests that this language be clarified to convey that the Texas Department of State Health Services places fish advisories recommending limiting fish consumption. However, fish consumption is only restricted by the amount that local fishers can catch. To date, the only action undertaken to restrict fishing has been advisory signage and the recent addition of a fence along a portion of the shoreline.</p>	<p>Text will be revised to provide the requested clarification.</p>
EPA-50	Section 2.2.7	Page 18, Surface Water Use.		<p>This section focus only on water use designation which does not let the whole story. Table 2-3 is not helpful because it does not use terminology common to Clean Water Act and it oversimplifies by not showing where the impaired segments (assessment units) are located (especially as related to the Site). Words such as suitable, unsuitable, approved or restricted should be replaced with impaired or designated where appropriate. The focus also should be on impairments specific to the segments affecting the site (i.e. not contact recreation in unrelated segments).</p>	<p>The text will be edited to use the language suggested by the comment, and information on areas fairly distant from the Site will be deleted.</p>
EPA-51	Section 2.3.2	Page 24, Sediment.		<p>Fourth paragraph references a county wastewater treatment facility. Harris County, the governmental entity, does not own or operate this facility. Please properly identify the owner of this wastewater treatment facility.</p>	<p>The text will be corrected.</p>

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EPA-52	Section 2.3.2	Page 25, Sediment.		<p>In this section is the statement:</p> <p>“Tidal dispersion may lead to some upstream transport and mixing, but the aggregate downstream movement of the sediment in the San Jacinto River system appears to limit the potential influence of downstream sediments on conditions within the Site (Louchouart and Brinkmeyer 2009).”</p> <p>This statement does not appear to be supported by the cited report. Please verify and revise as needed.</p>	The sentence will be modified and the citation removed, or the sentence will be deleted.
EPA-53		Table 2-1.		Highlands Acid Pit is listed in this table as a source of dioxin and furans. According to Site description posted on the EPA website summary, these are not listed as primary contaminants. Please verify the presence of dioxins and furans from the Highlands Acid Pit with documentation.	The text will be corrected.
EPA-54	Section 2.3.7.1	Page 30, Louchouart and Brinkmeyer (2009).		The second paragraph cites conclusions based on the Phase I report of Louchouart and Brinkmeyer (2009). This cite uses stronger language than the report does. Similarly, the final paragraph in this section uses stronger language than the report. Please adjust the cites to match the level of confidence expressed in the report cited.	The text will be edited to provide the appropriate emphasis, or direct quotations from the cited report to ensure the correct representation of the authors.
EPA-55	Section 2.3.7.6	Page 37, Summary.		The first bullet ends with a statement that is not conditioned as the report cited. This conclusion was based on modeling and was stated in the report with less certainty as the cite. Please adjust the cite to match the level of confidence expressed in the report cited.	The text will be edited to reflect the degree of certainty conveyed by the authors.
EPA-56	Section 2.6.1	Page 45, Historical Context.		Fifth paragraph refers to the “present town of Lynchburg.” The town of Lynchburg was the victim of subsidence and no longer exists as such. Please correct this reference in the document.	The reference will be corrected.
EPA-57	Section 4.1.4	Page 59, Global and Regional Dioxin and Furan Sources, Release Mechanisms and Transport Pathways.		The University of Houston and Parsons 2006 report and conclusions should be considered for inclusion and be cited in this section.	The University of Houston and Parsons (2006) is used extensively throughout this document.
EPA-58	Section 4.2.1	Page 60, Human Health Receptors.		The first paragraph in this section states “Fishers include children or adults who consume fish from within the Site boundaries either by boat or from along the riverbanks.” Please include wading as a means of harvesting fish and shellfish in this section and revise the associated Figure 4–4 for potentially complete and significant exposure pathway for Fishers to surface water through dermal contact.	The text will be modified to indicate that people may be wading at the Site. The CSM will be updated to show direct contact with surface water as a significant and complete pathway.
EPA-59	Section 6.1.1	Page 76, Sediment.		A large portion of the submerged areas around the Site are areas of sediment deposition from the San Jacinto River. As such, surface sampling of sediments may only sample relatively recent deposits of soils from upstream and not collect historical contamination associated with the Site and core sampling would be needed to verify the character of sediments in this area. In the current sediment sampling plan, core samples are planned to characterize contamination in some of the depositional portions of the San Jacinto River as indicated in Figure 14 of the Final Sediment Sampling and Analysis Plan (SAP) (and Section 2.1, third bullet in the text of the SAP). We recognize that this SAP as a phased approach to detecting contaminants and recommend that if the current plan of core samples in this depositional area detects chemicals of interest (COIs) or chemicals of potential concern (COPCs), that the following locations (illustrated in Figure 14 of the SAP) also be core sampled: SJNE034, SJNE044, SJNE045, SJNE036 and SJNE024.	The Sediment SAP and the associated sampling were complete at the time this comment was received. The requested change to the sampling design could not be made. If unacceptable uncertainties remain after the recently collected data have been evaluated, and it is determined that additional data are needed, the suggested samples will be considered.

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EPA-60	Section 6.1.3	Page 80, Biota Investigation.		We look forward to commenting on the Tissue SAP as referenced in this section; however, our preliminary comments are that the list of species to be collected needs to include a comprehensive list of fatty fish that are consumed by Fishers as well as those with consumption advisories.	<p>The purpose of the RI is to gather information sufficient to make informed risk management decisions, and the design for tissue sampling reflects this. The tissue sampling design is intended to support both risk assessment and statistical analysis of the data to help define cleanup targets. The design requires that the biota sampled have a reasonable probability of spending a majority of their time at the Site, and a fairly close association with the sediment. These design components allow an evaluation of the improvements in fish tissue that will correspond to improvements in sediment quality. Many fish that could occur and be captured and eaten at the Site could have been exposed to dioxins and furans elsewhere in the Houston Ship Channel system, and therefore do not provide the information needed for evaluation of sediment remedial alternatives at the Site.</p> <p>Tissue lipids will be reported with each tissue sample, allowing the extrapolation of the concentrations of lipophilic chemicals in the tissue sampled to estimate concentrations in tissues with higher lipid content, if required.</p> <p>Please also see the response to Comment 30.</p>
EPA-61	Section 6.2,	Page 88, PRG Development.		We agree with using upstream data for preliminary remediation goals; however, due to tidal influence and storm surges since the Site was developed, careful consideration should be given to the upstream sample point(s).	Agree.

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition	Abbreviation	Definition
Anchor QEA	Anchor QEA, LLC	RI	Remedial Investigation
BERA	Baseline ecological risk assessment	RI/FS	Remedial Investigation/Feasibility Study
CDF	confined disposal facility	SAP	Sampling and Analysis Plan
COI	chemical of interest	SETAC	Society of Environmental Toxicology and Chemistry
COPC	chemical of potential concern	Site	San Jacinto River Waste Pits Superfund Site
CSM	conceptual site model	SJRWP	San Jacinto River Waste Pits
EPA	U.S. Environmental Protection Agency	SLERA	screening level ecological risk assessment
FS	Feasibility Study	TCEQ	Texas Commission on Environmental Quality
HSC/GB	Houston Ship Channel/Galveston Bay	TEF	Toxicity Equivalency Factors
Integral	Integral Consulting Inc.	TMDL	Total Maximum Daily Load
PAH	polycyclic aromatic hydrocarbons	TRVs	toxicity reference values
PCB	polychlorinated biphenyl	TXDOT	Texas Department of Transportation
PCDDs	polychlorinated dibenzo- <i>p</i> -dioxin	UAO	Unilateral Administrative Order
PCDFs	polychlorinated dibenzofuran		
PRG	Preliminary Remediation Goal		
QA/QC	quality assurance/quality control		